AMENDMENT NO. 1 JUNE 2017
TO
IS 14664 : 2010 AUTOMOTIVE VEHICLES — PERFORMANCE REQUIREMENTS AND TESTING PROCEDURE FOR BRAKING SYSTEM OF TWO AND THREE WHEELED MOTOR VEHICLES

(First Revision)

(*Page* 3, *clause* **3.29**) — Insert the following new clause:

'**3.30** Emergency braking signal means logic signal indicating emergency braking specified in **4.1.15** to **4.1.15.2**.'

(*Page* 3, *clause* **4.1.4**) — Substitute the following for the existing clause:

'**4.1.4** *Parking Brake System*

If a parking brake system is fitted, it shall hold the vehicle stationary on the slope prescribed in **5.1.1.4.**

The parking brake system shall,

a) have a control which is separate from the service brake system controls; and
b) be held in the locked position by solely mechanical means.

Vehicles shall have configurations that enable a rider to be able to actuate the parking brake system while seated in the normal driving position.

For 3-2, 3-4 and 3-5, the parking brake system shall be tested in accordance with **5.8**.'

(*Page* 4, *clause* **4.1.9**) — Substitute the following for the existing clause:

'**4.1.9** In cases where two separate service brake systems are installed, the systems may share a common brake, a common transmission, or both if the requirements of **5.13**are met.'

Price Group 2

(*Page* 5, *clause* **4.3.1**) **—** Insert the following at the end:

‘V_1= vehicle speed when rider actuates the control.’

(*Page*4, *clause* **4.1.14.4**) **—** Insert the following new clauses:

‘**4.1.15** When a vehicle is equipped with the means to indicate emergency braking, activation and deactivation of the emergency braking signal shall only be generated by the application of the service braking system when the following conditions are fulfilled.

NOTE — At the time of type approval, compliance with this requirement shall be confirmed by the vehicle manufacturer.

4.1.15.1 The signal shall not be activated when the vehicle deceleration is below 6 m/s^2 but it may be generated at any deceleration at or above this value, the actual value being defined by the vehicle manufacturer.

The signal shall be de-activated at the latest when the deceleration has fallen below 2.5 m/s^2.

4.1.15.2 The following conditions may also be used:

a) The signal may be generated from a prediction of the vehicle deceleration resulting from the braking demand respecting the activation and de-activation thresholds defined in **4.1.15.1**, or

b) The signal may be activated at a speed above 50 km/h when the antilock system is fully cycling [as defined in **5.9.19**(c)] and deceleration is at least 2.5m/s^2. The deceleration may be generated from the prediction described in **4.1.15.2(a)**.The signal shall be deactivated when the antilock system is no longer fully cycling.’

(*Page* 5, *clause* **5.1.1.3**) **—** Substitute the following for the existing clause:

‘**5.1.1.3** *Measurement of PBC*

The PBC is measured using either,

a) an ASTM International (ASTM) E1136-93 (Re-approved 2003) standard reference test tyre, in accordance with ASTM Method E1337-90 (Re-approved 2008), at a speed of 64 km/h; or

b) the method specified in Annex C

NOTE — Procedure prescribed in (a) is the preferred method.'

(*Page* 5, *clause* **5.1.1.4**) — Substitute the following for the existing clause:

'**5.1.1.4** *Parking brake system tests*

The specified test slope shall have a test surface gradient of 18 per cent and shall have a clean and dry surface that does not deform under the weight of the vehicle.'

[*Page* 8, *clause* **5.4.2**(c)] — Substitute the following for the existing clause:

'c) *Brake application*– Simultaneous actuation of both controls of both service brake systems in the case of a vehicle with two service brake systems or actuation of the single brake control in the case of a vehicle with one service brake system.'

[*Page* 9, *clause* **5.5.2**(c)] — Substitute the following for the existing clause:

'c) *Brake application*–Simultaneous actuation of both controls of both service brake systems in the case of a vehicle with two service brake systems or actuation of the single brake control in the case of a vehicle with one service brake system.'

[*Page* 13, *clause* **5.9.1**(c)] — Substitute the following for the existing clause:

'c) 'Fully cycling' means that the anti-lock system is repeatedly or continuously modulating the brake force to prevent the directly controlled wheels from locking.'

[*Page* 13, *clause* **5.9.3.1**(c)] — Substitute the following for the existing clause:

'c) *Brake application*–Simultaneous actuation of both brake controls in the case of a vehicle with two service brake systems or actuation of the single brake control in the case of a vehicle with one service brake system.'

[*Page* 13, *clause* **5.9.3.1**(d)] — Substitute the following for the existing clause:

‘d) *Brake actuation force* — The force applied is that which is necessary to ensure that the ABS will be fully cycling throughout each stop, down to 10 km/h.’

[*Page* 14, *clause* **5.9.5.1**(e)] — Substitute the following for the existing clause:

‘e) *Brake actuation force* — The force applied is that which is necessary to ensure that the ABS will be fully cycling throughout each stop, down to 10 km/h.’

[*Page* 14, *clause* **5.9.5.1**(f)] — Substitute the following for the existing clause:

‘f) *Brake application rate* — The brake control actuation force is applied in 0.1 – 0.5s.’

[*Page* 14, *clause* **5.9.6.1**(e)] — Substitute the following for the existing clause:

‘e) *Brake actuation force* — The force applied is that which is necessary to ensure that the ABS willbe fully cycling throughout each stop, down to 10 km/h.’

[*Page* 15, *clause* **5.9.7.1**(e)] — Substitute the following for the existing clause:

‘e) *Brake actuation force* — The force applied is that which is necessary to ensure that the ABS willbe fully cycling throughout each stop, down to 10 km/h.’

(*Page* 17, *clause* **5.12.3.4.6**) — Insert the following new clause at the end:

‘5.13 CBS Failure Test

5.13.1 *General Information*

a) This test will only apply to vehicles fitted with CBS of which the separate service brake systems share a common hydraulic or common mechanical transmission.

(b) The test is to confirm the performance of the service brake systems in the event of a transmission failure. This can be demonstrated by a common hydraulic hose or mechanical cable failure.

5.13.2 *Test Conditions and Procedure*

a) Alter the brake system to produce a failure causing a complete loss of braking in the portion of the system which is shared.

b) Perform the dry stop test specified in section **5.3**inthe laden condition. Other conditions to be observed are **5.3.1**(c) and .**5.3.2** (a), (b), (d), (e) and (f). Instead of the provisions in section **5.3.2**(c), only apply the control for the brake not affected by the failure.

5.13.3 *Performance Requirements*

When the brakes are tested in accordance with the test procedure set out in **5.13.2**., the stopping distance shall be as specified in column 2 or the MFDD shall be as specified in col 3 of the Table 3:

Table 4 Performance Requirements of Braking System
(*Clause* 5.11.3)

Vehicle Category (1)	**Stopping Distance (S) (Where V is the Specified Test Speed in km/h and S is the Required Stopping Distance in m)** (2)	**MFDD** (3)
Front wheel(s) braking only		
3-1	$S \leq 0.1$ V + 0.0111 V2	≥ 3.4 m/s^2
3-2	$S \leq 0.1$ V + 0.0143 V2	≥ 2.7 m/s^2
3-3	$S \leq 0.1$ V + 0.0087 V2	≥ 4.4 m/s^2
3-4	$S \leq 0.1$ V + 0.0105 V2	≥ 3.6 m/s^2
3-5	$S \leq 0.1$ V + 0.0117 V2	≥ 3.3 m/s^2
Rear wheel(s) braking only		
3-1	$S \leq 0.1$ V + 0.0143 V2	≥ 2.7 m/s^2
3-2	$S \leq 0.1$ V + 0.0143 V2	≥ 2.7 m/s^2
3-3	$S \leq 0.1$ V + 0.0133 V2	≥ 2.9 m/s^2
3-4	$S \leq 0.1$ V + 0.0105 V2	≥ 3.6 m/s^2
3-5	$S \leq 0.1$ V + 0.0117 V2	≥ 3.3 m/s^2

(*Page* 24, *Table* 3) — Insert the following new Annex:

‘ANNEX C

[*Clause* 5.1.1.3 (b)]

ALTERNATIVE METHOD FOR THE DETERMINATION OF PEAK BRAKING COEFFICIENT (PBC)

C-1 GENERAL

a) The test is to establish a PBC for the vehicle when being braked on the test surfaces described in **5.1.1.1**and **5.1.1.2**.

b) The test comprises a number of stops with varying brake control forces. Both wheels shall be braked simultaneously up to the point reached before wheel lock, in order to achieve the maximum vehicle deceleration rate on the given test surface.

c) The maximum vehicle deceleration rate is the highest value recorded during all the test stops.

d) The PBC is calculated from the test stop that generates the maximum vehicle deceleration rate, as follows:

$$PBC = \frac{0.566}{t}$$

where

t = time taken for the vehicle speed to reduce from 40 km/h to 20 km/h in s.

NOTE — For vehicles unable to achieve a test speed of 50 km/h, PBC shall be measured as follows:

$$\text{PBC} = \frac{0.566}{t}$$

where

t = time taken, in seconds, for the speed of the vehicle to reduce from 0.8 V_{max} to (0.8 V_{max} - 20), where V_{max} is measured in km/h.

e) The value of *PBC* shall be rounded to two decimal places.

C-2 VEHICLE CONDITION

a) The test is applicable to vehicle categories 3-1 and 3-3.

b) The anti-lock system, if fitted, shall be either disconnected or inoperative (ABS function disabled), between 40 km/h and 20 km/h.

c) Lightly loaded.

d) Engine disconnected.

C-3 TEST CONDITIONS AND PROCEDURE

a) Initial brake temperature: ≥ 55 °C and ≤ 100 °C.

b) Test speed: 60 km/h or 0.9 V_{max}, whichever is lower.

c) *Brake application* — Simultaneous actuation of both service brake system controls, if so equipped, or of the single service brake system control in the case of a service brake system that operates on all wheels.

For vehicles equipped with a single service brake system control, it may be necessary to modify the brake system, if one of the wheels is not approaching maximum deceleration.

d) Brake actuation force — The control force that achieves the maximum vehicle deceleration rate as defined in paragraph C.1.(c).

The application of the control force must be constant during braking.

e) Number of stops–Until the vehicle meets its maximum deceleration rate.

f) For each stop, accelerate the vehicle to the test speed and then actuate the brake control(s) under the conditions specified in this paragraph.'

(TED 04)

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